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2411
DATE MAILED:
05/22/96

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined   ☑ Responsive to communication filed on ___5/3/96___   ☐ This action is made final.

A shortened statutory period for response to this action is set to expire ___3___ month(s), ___0___ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I   THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____

Part II   SUMMARY OF ACTION

1. ☑ Claims ___85 - 125___ are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims ___85-125___ are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☑ Other   See Attached (Part III)

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

Part III   DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

2.   Claims 85-125 are rejected under 35 U.S.C. § 103

as unpatentable over "Cyberarts: Lanier of VPL on 'voomies,' and

VR's future" by Linda Rohrbough and "Virtual reality: a status

report" by Linda Jacobson and further in view of 'Virtual Reality

offers growing opportunity for risk takers by Len Hindus;

'Virtual Reality is almost real' by Paul Saffo; PV-Wave for

Financial Applications; PV-Wave Command Language; PV-Wave Point

and Click Visual Data Analysis Software.

3.   As to claim 85, the Rohrbough article discusses trends in

use of Virtual reality (VR). The article discloses several

virtual reality environments in which users simulate movement

through and interact with elements in the environment. These

environments include industrial applications such as building

design, product marketing schemes, product designs and financial

modeling. According to Rohrbough, use of virtual reality to

model abstract information such as that found in financial

databases "is being done because a physical module is easier for

people to understand".

The Jacobson article is also directed to a discussion of

trends in the world of virtual reality. This article also

suggests financial modeling as one use of virtual reality.

Specific examples of such modeling given include stock market

predictions, sales forecasts, and analysis of industrial

problems.

Thus, the prior art clearly suggests use of a virtual

reality generator to display financial information in a virtual

reality world. While neither article teaches the details of the

virtual reality system needed to implement this particular

application, they both suggest that the level of skill for the

ordinary artisan at the time of publication was such that no

undue experimentation would have been needed. See for example,

the Jacobson and Rohrbough articles which discloses several

existing virtual reality applications by the University of North

Carolina and VPL Research.

In addition, the Examiner directs attention to the Hindus

and Saffo articles as well as those relating to PV-WAVE for

further evidence of the level of skill in the art. Thus, the
ordinary artisan would have been able to generate 3D models of a
desired environment, including modeling of financial data, for
display to the user and to not only display these environments to
the user but to do so in a fashion which allows the user to
"navigate" through it. As also disclosed by the prior art, the
skilled artisan would have been able to generate 3D models of
financial data.

The Examiner asserts that a virtual reality system which
models financial data would have included a virtual reality
generator module, as recited in claim 85; the input module, in
order to receive information for generating the required models,
and a user interface to receive information on how models are to
be displayed, (i.e., the display parameters).

The invention as recited in claim 85 differs from the above
cited art in that it explicitly recites use of financial analytic
systems and a user interface means having first and second inputs
which inputs are used in further processing of financial
information. As characterized in the specification and
Applicants Remarks, these first and second inputs are analogous
to the means by which PV Wave Point and Click Image Processing
and Data Display selects the output format for PV Wave for
Financial Application on x and y axes. Particularly see
illustrations of PV Wave for Financial Application having
financial category (e.g. Selected Stocks) selected with a related

display parameter selected (e.g. Cumulative Percent Change). The
Examiner respectfully asserts that parameters to determine which
elements of models are to be displayed to the user would have
been included in order to show only selected items.

As to the element of input from a financial data feed
system, PV Wave for Financial Applications discloses financial
application which receive "data feeds from disparate sources".

As to the element of using pre-stored and real-time data,
the Rohrbough article discloses use of a financial database for
supply of data needed for the VR system. The Examiner asserts
that it is well known for the ordinary artisan to make use of a
database for storing financial data. Further, data which is to
be displayed may be stored for subsequent retrieval and
processing. PV Wave Financial Applications specifically
discloses real time data analysis.

Applicant's new claim language recites coupling among
various modules. As noted above, PV Wave Financial Applications
specifically discloses real time data input and analysis and also
a user interface means having first and second inputs,
which inputs are used in processing of financial information.
One of ordinary skill in the art of VR technology would have
recognized the need to provide the particular connections among
modules necessary to route information. Applicant provides no
evidence that the claimed invention has connections which are
patentably distinct over the art of record.

The rejection set forth above is proper because it is made as a combination of elements which would be known to one of ordinary skill in the art of data presentation using computer technologies at the time of the invention. The Examiner has effectively relied on two sets of related references, Rohrbough/Jacobson and other references cited. For disclosure of VR technologies the Rohrbough/Jacobson combination is relied upon; for the details of financial manipulation, the other references. It is true that neither of these two sets discloses the invention as claimed. If any reference had, a 35 USC Section 102 rejection would have been given. Rather, the reasonable combination is made for a 103 rejection. The invention occurs in the environment of using computerized systems used to effectively present financial information in a visual way. All of the references cited are within this environment and would have been available to a practitioner at the time of the invention. The Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlin, 170 USPQ 209 (CCPA 1971). References are

evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA) 1969. In this case, the Rohrbough/Jacobson combination discloses VR technologies, including their application to the visual presentation of financial data. The other references cited above provide the detail of such financial data as is to be presented. As the references are within the same environment, they may be evalauted by what they would suggest to one of ordinary skill in the art of visual presentaion of financial information. With this criterion, the elements are properly combined.

Use of stereoscopic head-mounted display devices in VR is well known.. Claim 86 is rejected.

The Examiner respectfully asserts that if financial information is displayed in the VR medium then it would have been displayed in metaphors. Claim 87 is rejected.

Claims 88-89 recite specific metaphors. The Examiner respectfully asserts that use of geometric shapes to model financial data would have been obvious to one of ordinary skill in the art, because it provides the user with a structure, as cited by Rohrbough, which is easier for users to understand. Thus, specification of geometric primitives in general and

polygons in particular would have been obvious to one of ordinary
skill in the art, because it provides the user with a physical
object to associate with the financial data.

Claims 90-91 require metaphors to be rotatable and to have
variable luminance. The Examiner respectfully asserts that in
order for the user to see the entire shape, the metaphor must
either rotate and the user stand still or the user walk around
it. Selection of either technique would not create a patentable
difference as they are the most obvious means of allowing the
user to see the entire metaphor. Variable luminance would allow
shading (a well known technique in 3D imaging) and would have
also served to highlight a metaphor of interest. Claims 90-91
are rejected.

The Examiner respectfully asserts that it would have been
obvious to allow the user to select which metaphors or
representations the user wished to more closely explore. As
discussed above, rotation of the metaphors would have been an
obvious technique for presenting the entire metaphor to the
viewer. Concerning the additional feature of a third input, PV
Wave Point and Click discloses N-dimensional Visualization which
would have required additional inputs for additional dimensions
modeled. Claim 92 is rejected.

The Examiner respectfully asserts that flashing of displayed
data is a well known method of highlighting such data for the
viewer. See also the discussion of Claim 92. Claim 93 is
rejected.

As addressed in the rejection of claim 85, the prior art
clearly suggests use virtual reality for display of financial
data. Data relating to financial instruments is one well known
type of financial data. Further, the Jacobson, see the final
page of the article, suggests use of virtual reality for stock
market predictions. Claim 94 is rejected.

Jacobson discloses as one environment a CAD/CAM application
Boeing protospace "in cockpit to design for crews". Claim 95 is
rejected. The Examiner respectfully asserts that use of wire
frame displays (i.e., grid of subregions) CAD/CAM applications is
well known. Claim 96 is rejected.

The Examiner respectfully asserts that once the idea of
using virtual reality for display of financial information is
known, the particular data and the particular format used to
display the data becomes a design choice of the user. Further,
display of financial information for a single industry or market
including more in depth display of market data for this industry

or industry data for this market is well known. Claim 97 is

rejected.

Use of a VR medium for display of stock related data is

disclosed in the Jacobson article. The Examiner respectfully

asserts that in order to select which stock and which attribute

of that stock would be displayed to the user, related data would

have to be generated as a function of category and display

parameter. Claim 98 is rejected.

As discussed above, the Jacobson article suggests use of

virtual reality for stock market predictions. Thus, it would

have required no hindsight to make use of this medium for stocks,

bonds, and commodities. Use of the attributes recited in claim

99 to represent financial information is well known, see for

example the PV-WAVE articles. As discussed above, it would have

been obvious to make use of a virtual reality medium for

presentation of stock related data. Claim 99 is rejected for

obviousness.

The Examiner respectfully asserts that one skilled in the

art would have been motivated to update the images as often as

necessary in order for it to appear realistic and uninterrupted.

Claim 100 is rejected.

The references applied in the rejection of claim 85 disclose use of virtual reality for a variety of applications. One skilled in the art would have been motivated to allow simultaneous display of these environments in order to allow a plurality of users to use the system at once. This could be implemented via use of adequate computing means and would have been motivated by the desire to increase customer convenience and satisfaction. Claim 101 is rejected.

The skilled artisan would have been motivated to allow a use to select a desired metaphor for a more in-depth analysis in order to allow the user to focus on information the user decides is of more interest. Any information specific only to that metaphor and which could not easily be incorporated into the display could have been presented in a hierarchial manner (i.e., retrieved by selection of that particular metaphor). Claim 102 is rejected.

Presentation of audio information in a virtual reality medium is well known. Motivation to do so in a financial environment would be to present orally information about the metaphor thereby providing additional information to the user. Claim 103 is rejected.

Limitations in claims 104 and 106 are found in the references as applied to claim 85 above. Further, the Examiner respectfully asserts that data would have been continuously modified, updated and displayed to the user in order for the display to appear smooth and realistic. As to the element of preprocessing data in Claim 106, such preprocessing by an analytic system prior to its receipt by the input module would occur via use of a means, such as PV-WAVE, for generating 3D representations of the data. Further, the Examiner directs attention to financial analysis systems such as the CAPRI, developed by Applicant, and available to the public more than a year before the effective filing date of the invention.

The Examiner respectfully asserts that one skilled in the art would have been motivated to update the images as often as necessary in order for it to appear realistic and uninterrupted. Claims 105 and 107 are rejected.

The Rohrbough article discloses use of a financial database for supply of data needed for the VR system. The Examiner respectfully asserts that it is well known for the ordinary artisan to make use of a database for storing financial data. Further, data which is to be displayed may be stored for subsequent retrieval and processing or displayed on the fly (i.e., as it is generated). Motivation to display data as it is

generated would have been the desire to display the most current

form of data. This is most important in rapidly changing

environments (e.g., stock markets). Claims 108-110 are rejected.

Preprocessing of data by an analytic system prior to its

receipt by the input module would occur via use of a means, such

as PV-WAVE, for generating 3D representations of the data.

Further, the Examiner directs attention to financial analysis

systems such as the CAPRI, developed by Applicant, and available

to the public more than a year before the effective filing date

of the invention. Claim 111 is rejected.

Use of knowledge based and neural network systems for

analysis of financial data is well known. Claims 112-113 are

rejected.

Use of a headset for control of movement simulation and use

of monitors as well as head mounted display means for

presentation of data to the user are well known in arts which

make use of VR. Claims 114 and 116-117 are rejected.

Use of VR for display of financial information has been

discussed above. It would have been obvious to make use of

plural metaphors for a subset of the data since metaphors would

be necessary for display of the data in 3D form. Further, it

would have been obvious to make use of only a subset of the data since the user may only be interested in a portion of the data. See also the discussion of Claims 92 and 93 above. Claim 115 is rejected.

Claim 118 recites limitations found in claims 104, 106, and 108 and is rejected on the same basis.

Claims 119-122 recite subject matter found in claims 100-102 and are rejected on the same basis.

Claim 123 recites receiving information in packets and the limitations of claim 85. It is known in the computer arts to receive information in packets or as information flowing as a form or report. It would have been obvious to one of ordinary skill in the art to receive information in packets, because it allows access to information stored in a form or report format.

Claim 124 is rejected on the same basis as claims 85, 109 and 111.

Claim 125 recites limitations found in claims 104 and 123 and is therefore rejected on the same basis.

Double Patenting

4.   Claims 85-125 (108) are provisionally rejected
under the judicially created doctrine of obviousness-type double
patenting as being unpatentable over claims 85, 86 and 35-62 of
co-pending application Serial No. 07/954,775 referred to as
(775). Though the conflicting claims are not identical, they are
not patentably distinct from each other because independent
claim 85 (108) is a broader version of the narrower independent
claims in (775).   Therefore the limitations of claim 85 (108) are
found in the independent claims of (775).

This is a provisional obviousness-type double patenting
rejection because the conflicting claims have not in fact been
patented.

Claim 85 (108) differs from claim 85 (775) primarily in the
arrangement of the claimed elements and not the claimed elements
themselves. For this reason, though not identical, they recite
the same inventive elements and are not patentably distinct.

The limitations of claim 85(108) "enables the user to
simulate movement through financial data" is equivalent to "means
for simulating movement" of a virtual reality world of claim 36
(775).

The limitations of claim 86(108), except for use of
stereoscopic head-mounted display, are recited by claims 85 and

36(775) as applied to claim 85, and based on the well-known use of stereoscopic head-mounted display devices in VR.

The limitations of claims 88, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 99, 100, 101, 102, 103 and 98(108)are recited in claims 38, 37, 39, 40, 41, 42, 46, 47, 48, 49, 50, 57, 59, 60, 61, 62, and 56 (775) respectively.

The limitations of claim 97(108) are recited in claim 51(775), except "a single market". An industry and a market would have been an obvious modification for one of ordinary skill in the art, because an industry and a market are similar in scope and thus obvious.

Claim 104(108) differs from claims 85 and 36(775) as applied to claim 85 above, in that the input module continuously receives information. It would have been obvious to one of ordinary skill in the art to receive information continuously to present data in a real-time fashion as discussed above for claim 85(108), because it allows the user to have access to the most current information and takes advantage of well-known computer advancements making the systems more accurate.

The limitations of claim 106(108) are met by the limitations of claims 85 and 36(775) as applied to claim 85(108) above.

The limitations of claims 108-110(108), except the use of a
database, and real-time data feed are addressed in the
limitations of claims 85 and 36 (775) as applied to claim
106(108) above. The Rohrbough article discloses use of a
financial database for supply of data needed for the VR system.
The Examiner respectfully asserts that it is well known for the
ordinary artisan to make use of a database for storing financial
data. Further, data which is to be displayed may be stored for
subsequent retrieval and processing or displayed on the fly
(i.e., as it is generated). Motivation to display data as it is
generated would have been the desire to display the most current
form of data. This is most important in rapidly changing
environments (e.g., stock markets).

The limitations of claims 111(108), except for pre-
processing, are addressed by claims 85 and 36(775) as applied to
claim 106 (108) above. Preprocessing of data by an analytic
system prior to its receipt by the input module would occur via
use of a means, such as PV-WAVE, for generating 3D
representations of the data. Further, the Examiner directs
attention to financial analysis systems such as the CAPRI,
developed by Applicant, and available to the public more than a
year before the effective filing date of the invention.

The limitations of claims 112-113(108), except for knowledge based and neural networks, are addressed by claim 85 and 36(775) as applied to claim 106(108) above. Use of knowledge based and neural network systems for analysis of financial data is well known.

The limitations of claims 114, 116 and 117(108), except for display devices, are addressed by claims 85 and 36(775) as applied to claim 106(108) above. Use of a headset for control of movement simulation and use of monitors as well as head mounted display means for presentation of data to the user are well known in arts which make use of VR.

The limitations of claim 115(108), except for a plurality of metaphors representing financial information, is addressed by claims 85 and 36(775), as applied to claim 106(108) above. Use of VR for display of financial information has been discussed above. It would have been obvious to make use of plural metaphors for a subset of the data since metaphors would be necessary for display of the data in 3D form. Further, it would have been obvious to make use of only a subset of the data since the user may only be interested in a portion of the data.

The limitations of claim 118(108), are rejected in view of the limitations of claims 85 and 36(775) as applied to claims 85, 104, 106, and 108(108) above.

Claims 119-122(108) recite subject matter found in claims 100-102(108) and are rejected on the same basis as applied above in view of claims 85 and 36(775).

The limitations of claim 123(108) are addressed in claims 85 and 36(775) as applied to claim 85(108) above, except receiving information in packets. It is known in the computer arts to receive information in packets or as information flowing as a form or report. It would have been obvious to one of ordinary skill in the art to receive information in packets, because it allows access to information stored in a form or report format.

The limitations of claim 124(108) differs from claims 85 and 36(775), as applied to claim 85 above, in that information is received from a database of financial information. The Examiner respectfully asserts that it is well known for the ordinary artisan to make use of a database for storing financial data and to access that stored information. Further, data which is to be displayed may be stored for subsequent retrieval and processing. Controllably displaying data would fall under user parameters as information to be selected by the user.

Claim 125(108) recites the same limitations as claims 85 and 36(775), as applied to claim 85(108), except packets of information and continuously updating, which was discussed in the rejection of claims 123 and 104(108) respectively.

The limitations of claims 105, 107, and 119 (108) are recited in claim 59 (775).

The limitations of claims 101 and 120 (108) are recited in claim 36 (775).

The limitations of claims 121 and 102 (108) are recited in claim 37(775).

5.   Any inquiry concerning this communication or earlier
communications from the examiner should be directed to Charles
Kyle whose telephone number is (703) 305-9769.

     Any inquiry of a general nature or relating to the status of
this application should be directed to the Group receptionist
whose telephone number is (703) 305-3800.

DONALD E. McELHENY, JR.
PRIMARY EXAMINER
GROUP 2400

CRK
CRK
May 17, 1996